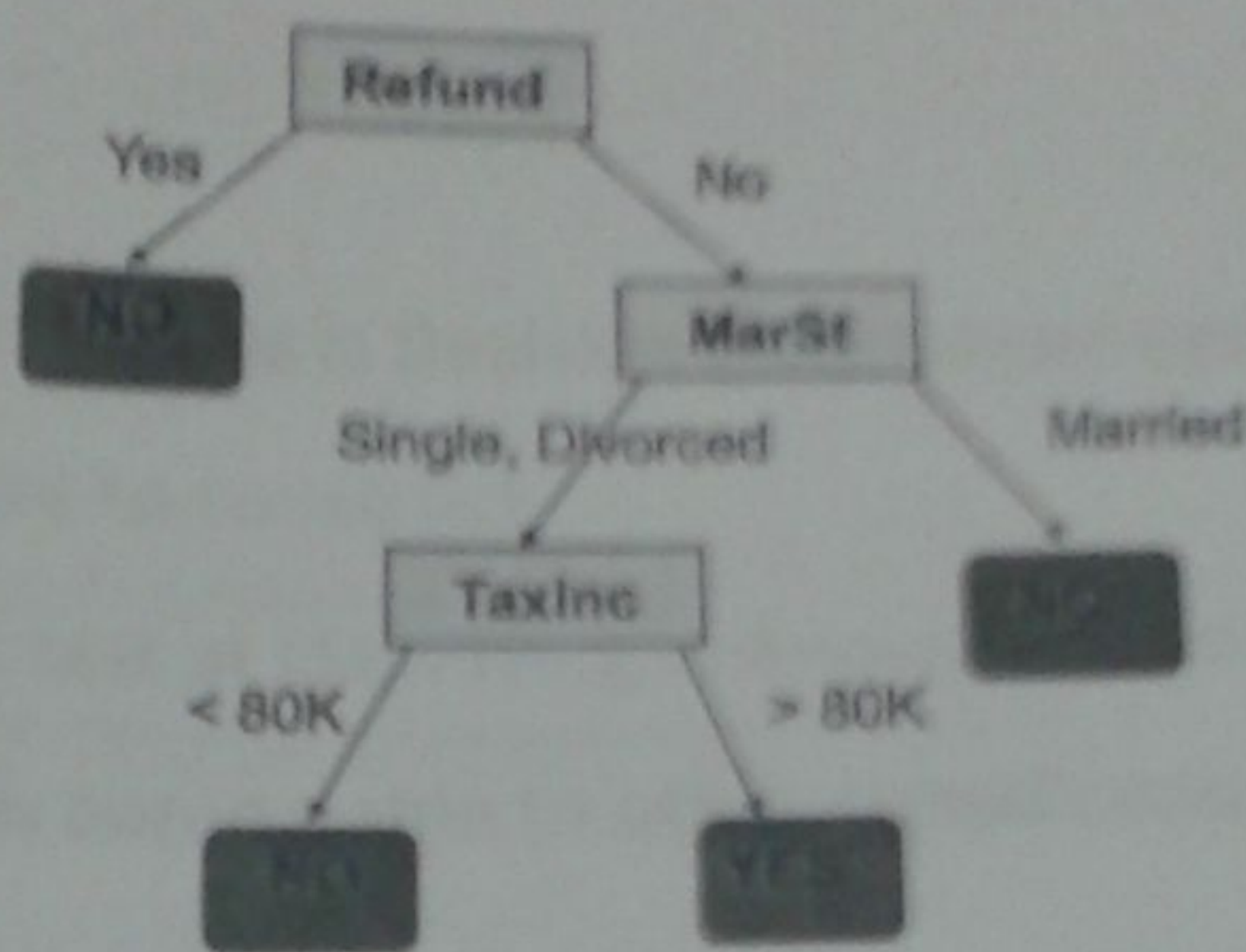


CS4319 – Data Mining & Warehouses
Midterm 2

- ✓ 1. Decision Trees are examples of:
- Clustering Techniques
 - ☒ Classification Techniques
 - Association Rule Mining Techniques
 - Regression Tree Techniques

- ✓ 2. Consider the following decision tree.



Refund	Marital Status
No	Married

What would be the answer for the record above (replace the ? with

- Yes
- ☒ No
- Can not be decided and decision tree should be grown further
- Can not be decided and decision tree should be pruned

3. Training Set → Learn Model is also called _____
Apply Model → Test Set is also called _____

- Deduction - Induction
- Induction - Deduction
- ☒ Learning-Validating
- Testing-Validating

✓ 4. Which of the following is (are) Measures of Node Impurity?

- I. Gini Index
- II. Entropy
- III. Misclassification error

- a. I
- b. I & II
- c. III only
- ☒ d. I, II, and III

① 5. GINI question

(c)

① 6. Which of the following is Decision Tree Advantages:

- I. Inexpensive to construct
- II. Extremely fast at classifying unknown records
- III. Accuracy is comparable to other classification techniques for many simple data

- a. I
- b. I & II
- ☒ c. III only
- d. I, II, and III

① 7. Given two models of similar generalization errors, one should prefer the simpler model. The more complex model, is the definition of

- ☒ a. Simple Model Theory
- ☒ b. Occam's Razor
- c. Basic Model Principle
- d. None of the Above

① 8. The method where you reserve 2/3 for training and 1/3 for testing is

- ☒ a. Holdout
- ☒ b. Cross Validation
- c. Bootstrap
- d. Stratified Training

9.

Cost Matrix	PREDICTED CLASS		
	C(i j)	+	-
ACTUAL CLASS	+	-1	100
	-	1	0

Model M ₁	PREDICTED CLASS		
		+	-
ACTUAL CLASS	+	150	40
	-	60	250

Model M ₂	PREDICTED CLASS		
		+	-
ACTUAL CLASS	+	250	45
	-	5	200

Accuracy of M1: 80 %

Accuracy of M2: 90 %

Cost (M1): 0(=)

Cost (M2): 0(=)

10. Given two models of classification:

- Model M1: accuracy = 85%, tested on 30 instances
- Model M2: accuracy = 75%, tested on 5000 instances

What test would help to find which model is better?

- a. Test of Accuracy
- b. Test of Reliability
- c. Test of Significance
- d. Test of Comparability

11. What are the goals of clustering:

- I. Minimizing Intra-cluster distances
- II. Maximizing Intra-cluster distances
- III. Minimizing Inter-cluster distances
- IV. Maximizing Inter-cluster distances

- a. I & III
- b. II & IV
- c. I only
- d. IV only

✓ 12. K-means is

- a) Medoid-based Hierarchical clustering
- b) Medoid-based Partitional clustering approach
- c) Centroid-based Hierarchical clustering
- ☒ d) Centroid-based Partitional clustering approach

13. Which of the following is true for K-means:

- I. The centroid is typically the mean of the points in cluster
- II. Most of the convergence happens in approximately mid-time of clustering
- III. Complexity is $O(n^2)$

☒ a. I & III

b. II only

c. I only

d. I, II, and III

✓ 14. Which one is the most common measure to evaluate K-Means Clusters:

- a. Cohesion
- b. Separation
- ☒ c. SSE
- d. Cluster Mean

15. Which of the following is solution to Initial Centroids Problem in K-means:

- I. Multiple Runs
- II. Bisecting K-means
- III. Sample and use hierarchical clustering to determine initial centroid
- IV. Post Processing
- V. Using $k/2$ centroids instead of k in initialization

a. I, II, IV

☒ b. I, II, V

c. I, II, III, IV

d. I, II, III, IV, V

✓ 16. Which one is not one of the limitations of K-Means?

- a. K-means has problems when the data contains outliers
- b. K-means has problems with differing cluster sizes
- c. K-means has problems with non-globular shapes
- ☒ d. K-means has problems with large number of clusters

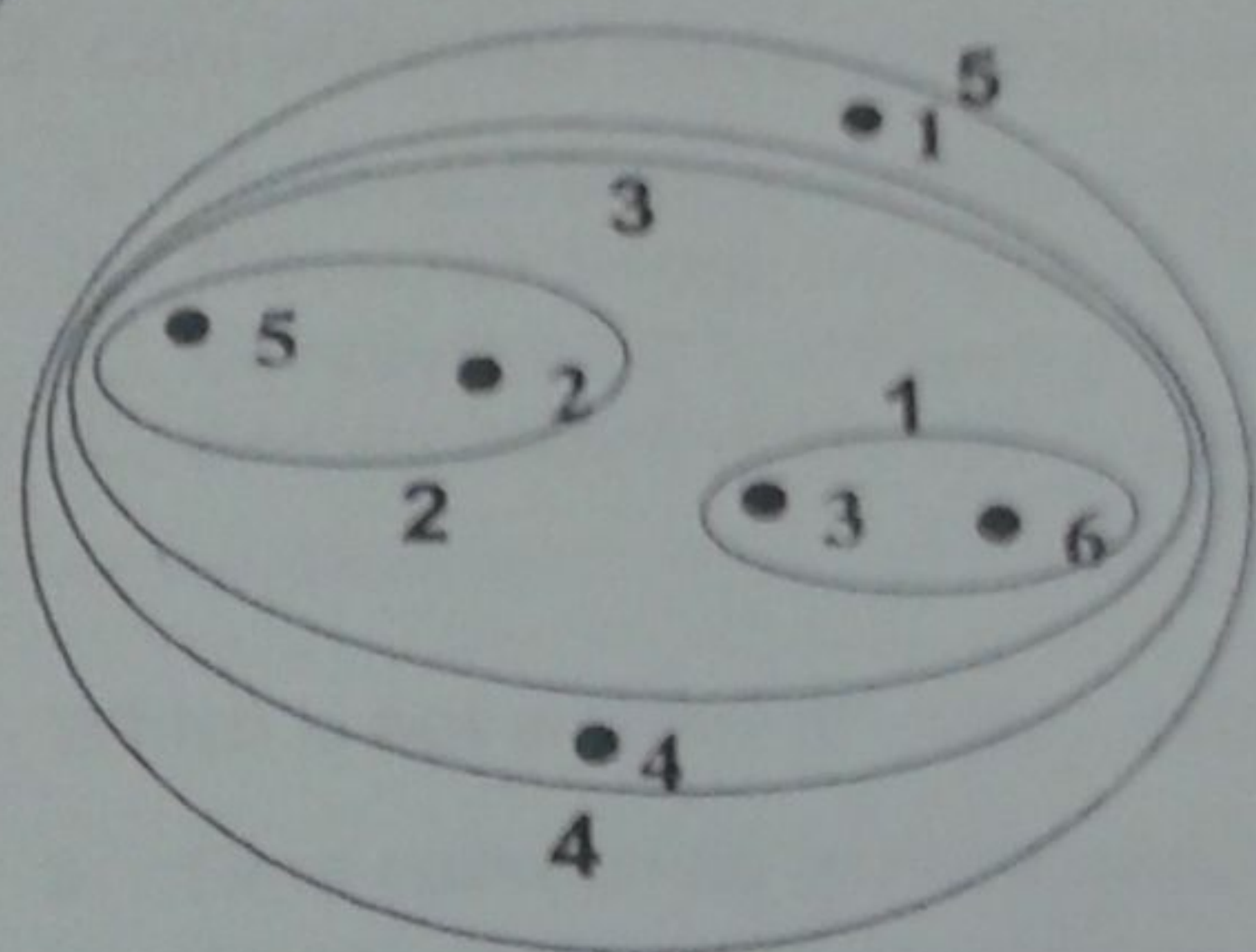
17. Using _____ for Cluster Similarity has following disadvantages:

- Biased towards globular clusters
- Tends to break large clusters

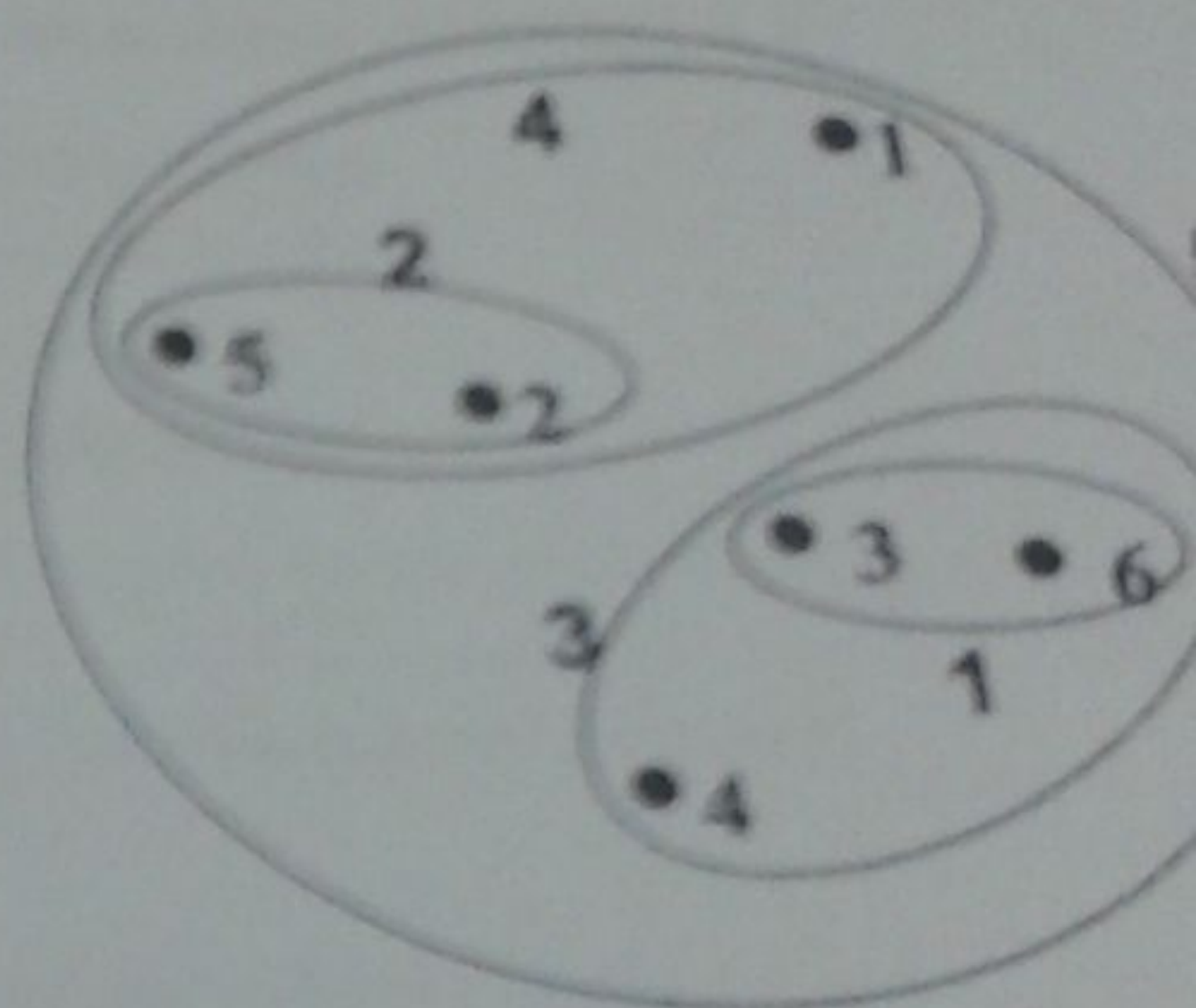
Which of the following should be inserted in _____?

- a. MIN
- b. MAX**
- c. Group Average
- (d) Objective Function

18. Fill out the blanks with MIN, MAX, Group Average, Ward's



Group Average **MIN**



MAX

✓ 19.

Entropy is a _____ type of index:

- a. Internal Index
- (b) External Index
- c. Relative Index
- d. Silhouette Index

20.

SSE

Entropy is a _____ type of index:

- (a) Internal Index
- b. External Index
- c. Relative Index
- d. Silhouette Index

_____ measures how closely related are objects in a cluster
 _____ measures how distinct or well-separated a cluster is from other clusters

- a. Cluster Cohesion - Cluster Separation
- b. Cluster Separation - Cluster Cohesion
- c. Cluster Similarity - Cluster Distance
- d. Cluster Distance - Cluster Similarity

22. Core point and border point are concepts in an algorithm that is a

- a. Prototype-based, Partitional Clustering Algorithm
- b. Prototype-based, Hierarchical Clustering Algorithm
- c. Density-based Partitional Clustering Algorithm
- d. Density-based Hierarchical Clustering Algorithm

3. Which is not a different when comparing K-means and DBSCAN:

- a. Time complexity of $O(m)$ whereas
- b. Whether or not they produce same set of cluster at each run,
- c. Whether or not using all data points in finding clusters
- d. Whether or not they are supervised or unsupervised

4. The method that predicts a value of a given continuous valued variable based on the other variables, assuming a linear or nonlinear model of dependency is :

- a. Correlation
- b. Regression
- c. Cohesion
- d. Separation

5. Measures that satisfy all 3 conditions of {positivity, symmetry, and Triangle Inequality} are called:

- a. Objective measures
- b. Metrics
- c. Distance Function
- d. Similarity Function